11/1/17 "Genius is 1% inspiration and 99% perspiration" -Thomas Edison

HW: "Adding & Subtracting Rational Expressions" w/s
Quarter Test Wednesday 11/8

AIM: How do we Add/Subtract Rational Expressions?

Warm Up:

1) $\frac{5}{19} + \frac{7}{38}$

$\frac{10}{38} + \frac{7}{38}$

$\frac{17}{38}$

2) $\frac{2}{15} - \frac{3}{25}$

$\frac{20}{150} - \frac{18}{150} = \frac{2}{150} = \boxed{\frac{1}{75}}$

The Basic RULE for Adding and Subtracting Fractions:

Get a Common Denominator!

Steps for Adding/Subtracting Rational Expressions:

1) Find a common denominator
(Don't forget to factor first)

2) Re-write the fractions so they have the same denominator.

3) Perform the indicated operations.

4) Simplify (Reduce) if possible.

Examples:

1) What is the least common multiple (LCM) of

$2x^2-8x+8$ *and* $15x^2-60$?

(Factor first)

$2(x^2-4x+4)$ $15(x^2-4)$

$2(x-2)(x-2)$ $15(x+2)(x-2)$

*The GCF the extra factors

$2(x-2)(x-2)(15)(x+2)$

$30(x-2)(x-2)(x+2)$

2) What is the sum in simplest form?

$$\frac{1}{3x^2+21x+30}+\frac{4x}{3x+15}$$

$(x+2)$

$3(x^2+7x+10)$ $3(x+5)$ $(x+2)$

$3(x+5)(x+2)$

$$\frac{1}{3(x+5)(x+2)}+\frac{4x^2+8x}{3(x+5)(x+2)}=\frac{4x^2+8x+1}{3(x+5)(x+2)}$$

3) Find the difference in simplest form

$$\frac{2x}{x^2-2x-3}-\frac{3}{4x+4}$$

(4) $(x-3)(x+1)$ and $4(x+1)(x-3)$

LCD: $4(x-3)(x+1)$

$$\frac{8x}{4(x-3)(x+1)}+\frac{-3x+9}{4(x-3)(x+1)}=\frac{5x+9}{4(x-3)(x+1)}$$

Practice:

a) $\frac{3}{4}+\frac{2}{7}$

b) $\frac{6}{x}-\frac{7}{x+3}$

LCD: $x(x+3)$

$\frac{6x+18}{x(x+3)}+\frac{-7x}{x(x+3)}$

$\frac{-1x+18}{x(x+3)}=\frac{18-x}{x(x+3)}$

c) $\frac{6}{x}+\frac{7}{xy}$

LCD: xy

$\frac{6y}{xy}+\frac{7}{xy}=\frac{6y+7}{xy}$

LCD: $12x$

1) $\frac{2x+3}{6x}-\frac{x-2}{4x}$

$\frac{4x+6}{12x}+\frac{-3x+6}{12x}=\frac{x+12}{12x}$

2) $\frac{3}{x+2}+\frac{x-2}{x}$

3) $\frac{6}{y-5}-\frac{y+5}{y^2-25}$

$(y-5)(y+5)$ $\Longrightarrow$ $\frac{\cdot 6}{y-5}-\frac{y+5}{(y-5)(y+5)}$

$\frac{6}{y-5}+\frac{-1}{y-5}=\frac{5}{y-5}$

4) $\frac{2}{a^2-4}-\frac{1}{a^2+2a}$

LCD: $a(a-2)(a+2)$

$\frac{2(a)}{(a-2)(a+2)(a)}-\frac{1(a-2)}{a(a+2)(a-2)}$

$\frac{2a}{a(a-2)(a+2)}+\frac{-a+2}{a(a-2)(a+2)}=\frac{1}{a(a-2)}$

5) $\frac{1}{2-x}+\frac{2}{x-2}$

6) $\frac{x}{x^2-4x+3}-\frac{x}{x^2+2x-3}$

5) $\frac{(x-2)1}{(x-2)2-x} + \frac{2}{x-2}\frac{(2-x)}{(2-x)}$ LCD: $(2-x)(x-2)$

$$\frac{(x-2)}{(2-x)(x-2)} + \frac{4-2x}{(2-x)(x-2)} = \frac{-x+2}{(2-x)(x-2)} = \frac{2-x}{(2-x)(x-2)}$$

$$= \frac{1}{x-2}$$

7) $\frac{y}{y-3}-\frac{18}{y^2-9}$

8) $\frac{2}{a+1}+\frac{3}{a^2-1}$

9) $\frac{2}{5a}+\frac{1}{4a}$

10) $\frac{1}{2a+2}+\frac{1}{a^2-1}$

11) $\frac{3}{x-3}+\frac{x}{3-x}$

12) $\frac{b}{b-1}-\frac{1}{2-2b}$

13) $\frac{1}{a+2}+\frac{a}{a^2+a}\div\frac{a}{a+1}$